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MASSACHUSETTS DEPARTMENT OF EDUCATION

APPLICATION STUDY TEAM

REPORT

JANUARY, 1986

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SCHOOL AND PUPIL-BASED INFORMATION NETWORK

EXECUTIVE SUMMARY

OVERVIEW

The School and Pupil-Based Information Network (SPIN) is perhaps the most comprehensive information system development concept ever proposed for the Massachusetts educational environment.

This initiative envisions a statewide, interactive network of host computers electronically linked to automated systems within individual schools. The host(s) data base, instead of being aggregated or summarized at the school or district level, as currently occurs with the use of manual data collection instruments, would consist of selected data elements from student records and related teacher, curricula, schedule, and school and financial files which would be regularly updated by the schools as they locally perform their day-to-day responsibilities.

The SPIN network and the common host(s) data base--combined with authorized access by local school, school district, and Department staff--would have a profound impact upon the manner in which education data is collected, used, and managed throughout the system.

For example, SPIN would:

- Generate all of the timely and accurate data required for programmatic and administrative responsibilities, virtually eliminating manual collection instruments.
- Ensure a meaningful implementation of the Act Improving the Public Schools of the Commonwealth (Chapter 188 of the Acts of 1985) and related provisions of the Board of Education's Management Plan, resulting in an on-going assessment of the condition of education throughout the Commonwealth and providing the basis for recommendations for change.
- Provide remote access by schools/districts to the common data base thereby allowing them to compare themselves and their performance with comparable schools and districts.
- Improve the level of technical assistance to schools and school districts by administering the system in a service bureau fashion.
- Represent a major catalyst for partnership and interaction with other segments of the educational community and beyond.

- Save millions of dollars throughout the educational system from:
    - Reduced administrative costs.
    - Increased productivity.
    - Development and distribution of public domain and site-licensed software.
    - Reduced duplication of effort and use of bulk purchases.
    - Improved quality of educational services.
    - Improved accountability.

Management of the proposed statewide network would be the responsibility of a joint committee of local educational agency (LEA) and Department of Education representatives. This decision making body would oversee the maintenance and directions for future growth of the system.

CREATING THE SCHOOL LEVEL DATA BASE

The goal of SPIN is to automate the functional processes at the local school to create an interactive data base which consists of data elements currently generated in the course of conducting the school's daily business.

Examples of the types of data that are currently generated, some of which provide the basis for manually responding to hundreds of Department requests for information, include:

- Student Data, such as identification, demographic, enrollment, regular program/activity, special programs, education plan, attendance, drop-outs, suspensions, basic skills (Chapter 188), courses, grades, credits, and approvals.

- Staff Data (Teaching/Non-teaching), such as identification, demographic, certification, absence type, substitutions, non-teaching responsibilities, salary, entitlements, and evaluation results.

- School Data, such as identification, calendar, graduation requirements (courses/credits), facilities, buildings, and assessment (Chapter 188).

- Course/Activity Data, such as course identification, program, level, sections, credits, prerequisites, categorization (Chapter 188), services, and extra-curricular.

- Schedule Data, such as student, teacher, course, section, rooms, times, and reporting of all exceptions to the planned schedule.
- Financial/Accounting Data, such as school level revenue and expenditure categories consistent with Department of Education and Department of Revenue reporting requirements.

CREATING A STATEWIDE NETWORK

From each local school, selected fields from the above files would be forwarded electronically to a common host computer system and updated on a scheduled basis.

The computers may reside in one location or perhaps be in a number of different sites but linked electronically to give the appearance to the user that it is one "transparent" system.* The common host would not include the confidential data, such as names or other elements protected by the privacy laws, and user access to the data base would be strictly controlled.

In recommending the use of a common host system, it is implied that a statewide system for storing local school data that is accessible to schools, the LEAs, and Department of Education staff is highly desirable. The standardization of data entry, storage, and access would greatly increase both local and state productivity and efficiency. The critical element in all of this is that the host computers would contain individual records, rather than summary school or district data, thus providing a tremendous increase in analytical, statistical, and administrative capacities. Access to the common host computer system also would provide access to system tools such as a standardized query language, program generators, and report generators. Software residing on a common host offers the opportunity to make modifications by programming the changes only once, at which point they become immediately available to any of the users on the system.

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* A "transparent" system is one in which a user signing on to a terminal linked to the common host would not be aware of what equipment or signals are used to allow access to and utilize the common data base.

BACKGROUND

This project is sponsored by the Office of the Deputy Commissioner for Program Operations of the Massachusetts Department of Education. The work was conducted in two phases: an initial two and one-half day planning session in May, 1985 followed by an eight-week intensive period during August, September, and October 1985. The Application Study Team, composed of five Department staff, participated in both phases assisted by an outside facilitator. Members were selected for their agency-wide perspective on management information processes and requirements. This report is intended to describe the concept of a School and Pupil-Based Information Network as recommended by the Application Study Team in response to the problems associated with the collection, use, and management of education data.

The Team is now obtaining feedback on the project from principals, superintendents, business managers, and teachers from local school systems; from other education constituents; and from Department staff. This feedback will allow the modification of the system based on local and state information needs, and will assist in the design of an initial feasibility pilot test.

CHAPTER ONE

THE NEED FOR A SCHOOL AND PUPIL-BASED INFORMATION NETWORK (SPIN)

This report describes a proposed School and Pupil-based Information Network (SPIN), a statewide computerized information system designed to provide Massachusetts public schools/districts and the state Department of Education with accurate, timely information that enables each agency to fulfill its respective missions. The report describes what the system might look like and its ability to achieve certain objectives, but does not address the specific technology by which it might be implemented.

SPIN improves upon the current information system because it:

- Emphasizes data collection as a by-product of normal day-to-day school operations.
- Provides more equitable and efficient access to computer resources and data.
- Integrates various kinds of education data.
- Utilizes current microcomputer technology and communication systems.

SPIN is designed to accommodate the divergent and similar information needs of different interest groups.

EDUCATION INFORMATION NEEDS

Currently a variety of groups use Massachusetts education data. These audiences are schools, local and regional school districts, collaboratives, the Department of Education, the Board of Education, the Governor's Office, the Legislature, the federal government, parents, students, and other education constituencies. Each has a different set of information needs to which the education information system must respond. A summary of the special information needs of the major audiences follows:

- Local Schools.

  Much has been written about the importance of the individual school building as the critical unit where education takes place. Schools are called upon to perform many administrative tasks that support education such as record-keeping, counseling, parental conferences, meal services, and building management. A school benefits from efficient and orderly systems that minimize time spent in administrative duties and maximize time devoted to educational activities. Schools need access to computing facilities and systems for performing these administrative tasks, and for communicating with local district offices. Moreover, by electronically networking with other districts, schools could obtain new information.

- **School Districts.**

  School districts have daily responsibility for operating and financing elementary and secondary schools. They require data which is practical, timely, and useful for program planning, such as the amount of state aid they will receive or whether they qualify for a certain grant or subsidy. They also need assistance in estimating enrollment and student composition changes, and in estimating the supply of instructional staff for certain subject areas. More recently, school districts are asking for comparative data to assess their programs with respect to other districts.

- **Department of Education.**

  Responsibility for access to quality education rests with the state. In addition to providing leadership to local public schools, the Department ensures that schools are meeting all regulatory requirements for state and federal programs. Perhaps the strongest tool a state education agency uses to fulfill its mission is a powerful information system which can inform staff about needs, resources, and services. This system is both the substance and the means for providing technical assistance to schools. The Department is also the pivotal point through which data enters the information system and is dispersed to all other education audiences. An efficiently managed, well-constructed data base must be accessible to all users.

- **Board of Education.**

  As the decision making and policy making body for education, the Board must have a statewide view of school programs, policies, and practices. Data for the Board should consist of clear, well-focused summaries of critical issues and student outcomes. In its policy making role, the Board continually must be aware of emerging trends in Massachusetts, in comparable states, and at the national level.

- **Governor and Legislature.**

  The Governor and Legislature need timely, authoritative information that emphasizes statewide implications of different programs and initiatives. Both branches of government must seek accountability and evaluate the success of various educational mandates for which millions of dollars have been appropriated.

- **Federal Government.**

  The U.S. Department of Education monitors federal funds allocated to the state for programs such as special education and occupational education. In light of this role, the federal government requires information from the state to assure that funds are expended in accordance with program requirements. The federal government also collects extensive data on student enrollment, educational personnel, state and local expenditures, and revenues which are used to monitor national trends.

- **Parents, Students, and Other Groups.**

  Parents, students, and other education constituencies seek accountability from schools, and want evidence of student performance and of high quality programs. The taxpayers of the Commonwealth deserve evidence that their tax dollars are being used responsibly and equitably. The Department must organize a data collection effort that will demonstrate whether, indeed, measurable gains are correlated with the infusion of increased funding.

These information needs are now joined by the new data collection and reporting requirements contained in Chapter 188 of the Acts of 1985, An Act Improving the Public Schools of the Commonwealth. This comprehensive reform law places new responsibilities on both state and local educators. The Department must collect new kinds of data and local districts must report new types of data. These new data collection/reporting areas include:

- Curriculum assessment.
- Eligibility for essential skills grants and discretionary grants.
- School and district evaluations.
- Statewide early childhood education needs assessment.
- Evaluation of educational technology.
- Evaluation of instructional materials.

The proposed information system will address the data requirements of Chapter 188 in addition to the existing information already being collected.

The remainder of this report outlines the information system designed by the Application Study Team to fulfill these new and current educational information needs. The following chapter outlines some current information problems and describes how SPIN addresses them. Chapter Three illustrates the dual uses of SPIN, as a data base and as the basis of a statewide information network. Functional and economic benefits of SPIN are detailed in Chapter Four, followed by the final chapter which discusses the Team's proposed process for validating SPIN in local pilot sites.

CHAPTER TWO

SCHOOL AND PUPIL-BASED INFORMATION NETWORK

New data reporting, collection, and analysis responsibilities add new burdens at both the state and local levels. These problems are related to the collection, use, and management of data. Some of the major problems are described as follows:

- **Data is recorded and collected in disparate formats.**

  Often it is necessary to access several files in order to respond to questions. Furthermore, because data are processed by technicians, accessing files requires a moderate degree of programming knowledge and an understanding of the Department's file structure.

- **The Department's reporting process is duplicative and burdensome to the agency and to local districts.**

  In addition to the two major collection instruments, the End of Year Report and the Fall Statistical Report, school districts must respond to approximately thirty additional reports. Many of these ask for the same or similar information.

- **Feedback of information to local schools, districts, and to other users is inadequate.**

  Routine feedback reports tend to inventory responses from school districts with little or no analysis of results while major reports are not produced in a timely fashion.

- **Data do not lend themselves easily to comparative analysis.**

  In order to determine growth and change, it is necessary to collect the same data over time. Yearly changes in reporting format make it difficult, and sometimes impossible, to monitor education trends.

- **Data collected focus on the school or district rather than the student.**

  Currently education data are collected at the school district level, highlighting individual schools as well as the entire district. Information about individual students, teachers, administrators, or programs is unavailable. Without these data elements, it is impossible to cross tabulate different educational descriptors.

- **Data recording and collecting procedures do not fully utilize current technology.**

  Many of the state's smaller school districts still perform daily record-keeping and annual reporting manually. This method is both arduous and costly to the school district. Even where adequate computing facilities exist, many districts still do manual reporting. Communication between schools/districts and the Department does not occur electronically despite the availability of advanced networking systems in Massachusetts.

The burden of collecting and reporting information, moreover, allows little time at either the local or the state level to use available information to analyze trends and plan appropriately for the future. Approximately 85% of the Department's staff time is spent on data collection efforts while 15% of staff time is directed toward providing technical assistance to school districts. Similarly, at the local level a significant portion of staff time is committed to collection and reporting, detracting from the primary mission of providing quality education services to the students of the Commonwealth.

GOALS

The three-to-five-year goals of the Application Study Team, reflected in the proposed system are, to:

- Reverse the present percentage of time devoted to data collection and reporting to allow greater staff concentration on technical assistance and analysis.
- Eliminate manual reporting.
- Maximize access to timely, accurate information.
- Implement Chapter 188.
- Provide data as one means of exhibiting leadership and direction to school districts in the Commonwealth.

Currently the Department of Education meets its major data collection responsibilities by requiring local agencies to report mandated pupil and financial information on predesigned reporting instruments at specific times of year. This information must be collected, compiled, and certified locally; reviewed by regional education center and central office staff; keypunched; edited; and prepared for distribution back to local officials. This is a cumbersome process which maximizes opportunity for error. It is also limited by being designed to meet state and federal information needs and schedules, not the requirements of actual local school operations and procedures.

The first major decision of the Study Team was to concentrate its efforts on identifying and defining current data operations and activities that occur at the school level, because the school is the point of entry for the majority of the data collected. An automated system based on the school's daily activities would allow for the reporting of information as a by-product of the school's normal operations. Data entered at its source would eliminate the need for duplicate entry and multiple levels of reporting.

Since pupil information is the basis of all school operations and the focal element for the major data collection efforts by the state, the Team's second decision was to develop a pupil-based system, rather than a financial accounting system.* A student data base will:

- Eliminate double counting of students.
- Allow cross tabulation of any element in the data base.
- Allow for complete integration of all data elements.

OBJECTIVE

As it evolved, the primary objective of the Application Study Team was to develop, test, and implement a computerized pupil-based information system based on current school activities or procedures where:

- **Data is entered once.**

  Data needed to support educational programs will be entered only once. All collection and reporting efforts will flow from this one entry. The need to retabulate and reenter information on numerous reporting instruments and surveys will be eliminated.

- **Data is entered at the source.**

  All data will be entered at the source, that is, by school, district, or Department personnel. Entries will be made only by those authorized and responsible for the data. (For example, state aid financial information will be entered only by the state; student information may be entered by two schools on a full time equivalency (FTE) basis if students are tuitioned in or out of a district; etc.)

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* Although the development of a financial accounting system is not an immediate goal, financial data will represent an important component. When final decisions on a uniform chart of accounts have been reached, an integrated financial system could be implemented through SPIN.

- **Data is integrated and accessible to authorized users.**

  Data entered at the source will permit cross tabulation of data and analysis of the interrelationships of data categories in a more meaningful way. Data element compatibility between schools, districts, and the Department will expand authorized user potential and permit analysis and comparisons based on shared access to a common data base.

- **The Department of Education is organized to support the system.**

  This system must be introduced and implemented with maximum coordination among all parties, with a clear understanding of goals and expectations, and with a firm commitment to the success of the project. Implementation of SPIN will require financial support from the Department to address software and hardware requirements, and to train Department and local staff.

The proposed SPIN system will provide timely information at the school, district, and state level with a minimum of paper flow and duplication of effort.

SCHOOL PROCEDURES

After several months of study and analysis of information from a variety of state and local resources, the Application Study Team identified how several school activities or procedures could be accomplished by a computerized system such as SPIN.

These school processes include:

- Enrolling students and recording demographic information.
- Defining courses/activities offered.
- Scheduling students.
- Allocating teachers.
- Recording daily, periodic, and exception information.
- Tracking financial information.

A preliminary outline of how these processes might be computerized is attached. (See Appendix.) However, a brief summary of how these responsibilities could be met and procedures could be implemented using SPIN follows:

- **Enrolling students and recording demographic information.**

  When a student is enrolled, the information immediately would be entered electronically into the computer system. Student enrollment data such as demographic information, special needs information, and grades entered into the system could be updated periodically and made accessible to other authorized service providers (i.e., data on tuitioned students, collaborative students, and so forth). While this data would be more accessible to more users, appropriate school personnel would continue to have the responsibility for maintaining the confidentiality of certain records and data elements.

- **Defining courses/activities offered.**

  The name, objective, prerequisites, grade level, instructional hours, texts, and materials of a course or activity all could be part of this data base. Support services or activities such as field trips, meals, transportation requirements, remedial services, and study halls could also be included. The Department of Education is creating a system that will categorize academic courses by functionality. This definition of courses will allow each school district to choose from a description of broad categories, the one that best describes the individual course offerings in that school. Course offerings will not be mandated by the state. Rather, definitions will enable local officials to categorize their courses on a standard system that can be used for statewide comparisons and analysis.

- **Scheduling students.**

  Scheduling students requires a number of steps from receiving course requests to matching students to courses and activities. When students are enrolled and course offerings and activities are identified, SPIN could facilitate matching the student with the activities. The student's schedule would be generated to include all daily activities, taking into consideration the preferences of the student, prerequisites, teacher availability, room size, and a variety of other factors. The schedule could be updated as changes occur and made available to students, parents, the student's teachers, the transportation coordinator, etc.

- Allocating teachers.

  Another application for SPIN is to create profiles of teachers, substitutes, and other teaching and administrative staff. The file would include demographic, certification, skills, and certain salary information. The file would enable administrators to allocate teacher time to specific funding sources, allowing for a grant tracking system. This data base could be coordinated with the existing state certification computer system to allow immediate access to certification status of employed teachers or to receive notification of qualified teachers available to fill vacancies. Information about substitute teachers could be used to assign qualified substitutes to appropriate assignments and to track the usage of substitutes by school, program category, or specific class.

- **Recording daily information and exceptions to the schedule.**

  Perhaps the most useful yet most difficult school activity to record on a manual system is tracking what actually takes place at the school level. This involves certifying that events have transpired as planned or scheduled, and recording the exceptions. For example, recording exceptions to a student's schedule allows for the tracking of excused and unexcused absences, cuts, and reasons for changes in schedule.

- **Tracking and accounting for financial information.**

  Financial data is monitored at the school district level rather than the school level. SPIN would be capable of receiving and processing input at the district level when the district is the source of the data. Before this is implemented fully, issues beyond the scope of this project must be resolved--primarily the structure and relationship of school and municipal accounting.

SUMMARY

The concept of an integrated student based information system is not unique. The benefits of SPIN have been highlighted in this chapter, but it is also important to note necessary cautions. The Department of Education recognizes and supports the responsibility of an individual school system to maintain the integrity of its records. The Department and local school districts realize, too, the importance of maintaining the confidentiality of student names and other data. This school based system, protected by appropriate safeguards, would provide both the Department and the local education agencies with current and future statistical data needed for reporting, planning, or monitoring purposes.

SPIN is an evolving system which will enable the electronic movement of data and information between all levels of the state educational system--including schools, districts, and the Department's regional education centers and central office--and other government entities. The success of the system depends on an ability to create a network of school-based systems to achieve compatibility with SPIN. The data elements included in this document are the required elements which must be incorporated within local automated student information systems. School districts, however, may add additional data elements, which are necessary to meet local needs, within their automated system. The administration and maintenance of SPIN would be a shared responsibility of LEA and Department representatives. Decisions for maintaining the system in a service bureau mode would rest with a joint administrative council.

CHAPTER THREE

USING THE DATA BASE TO CREATE A STATEWIDE NETWORK

Chapter Two described how SPIN could record the numerous activities and responsibilities of operating a school. Before discussing the use of the data base, it is essential to understand that SPIN is basically a system that operates on two levels. While on the one hand it is an information system located at the school level, it is also linked electronically into a statewide network.

CREATING THE SCHOOL LEVEL DATA BASE

The school data base begins with the recording of the basic activities such as pupil information, teacher and class assignments, program placements, and grades earned. While some schools have developed computerized record-keeping systems, most schools maintain some form of a manual system for collecting this information. As noted earlier, the goal of SPIN is to automate the current procedures for collecting, storing, and using this data. The resulting school data base could generate information which is integrated and more accessible. This data base could reside on a microcomputer or it may be linked to an existing district or regional mini or mainframe computer.

The primary use of the computerized record-keeping system would be to enhance the schools' daily business. Figure 1, p.11 describes the following six basic categories by which information could be stored on SPIN:

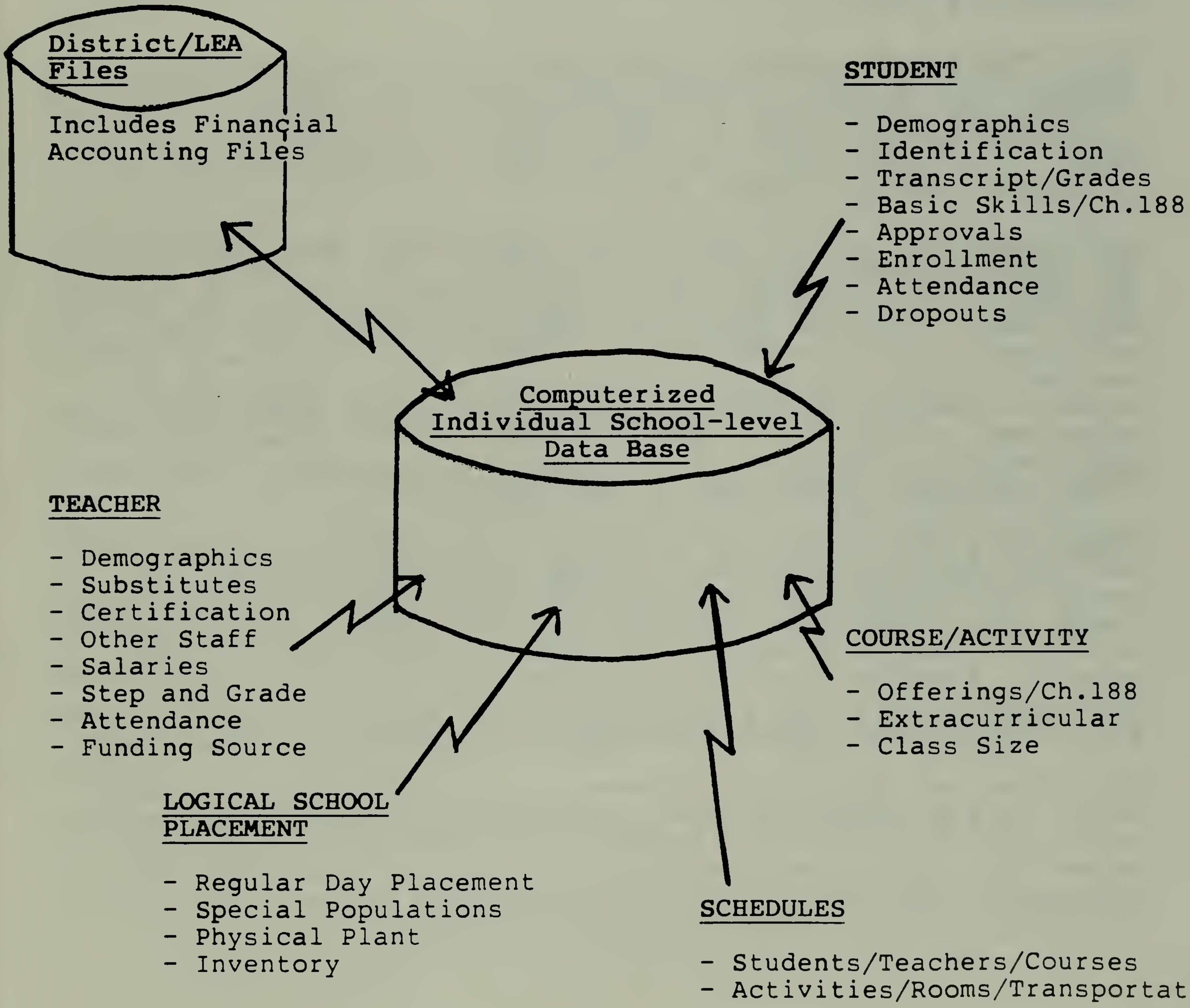
- Student data, such as enrollment, grades, basic skills data, assessments, special approvals, medical certifications, and emergency notifications.
- Teacher data, such as demographic information, certification levels, attendance, and use of substitutes.
- Logical School Assignment, i.e., any educational environment where a student may be placed, including a regular public school or a special education collaborative.
- Courses and activities offered.
- Schedules, i.e., the joining together of students, teachers, courses, room assignments, transportation, etc.
- Financial and accounting data related to the school pupil data base.

Each school or location where students are assigned will continue to record student information, but record keeping will be automated. Those files which are necessary and appropriate for the common host will be forwarded electronically on a predetermined schedule. Updates can be made daily or even weekly.

FIGURE 1.

School and Pupil-Based Information Network

Figure 1 illustrates the categories of school-level daily operations which are merged into one data base. Local maintenance of the data would require recording only changes or exceptions.



RECORD DAILY EXCEPTIONS
TO THE SCHEDULE

LINKING TO A COMMON HOST

Through SPIN, each local school's data base would contribute to a statewide data base. Selected files would be forwarded electronically to a common host system. In other words, a single or series of networked computers would make data accessible to all users in the system.

The concept of a common host represents a statewide system for storing and sharing common, public information retrievable by any number of authorized users. Many states currently have electronic networking enabling a user to sign onto a statewide network through a microcomputer or terminal to access authorized levels of stored data for the purpose of updating files, retrieving information, or generating a report.

Host computers may reside in one location, or in two or three different sites, but are linked electronically. The standardized or public files residing on the common host would not include confidential data, such as names or other elements protected by the privacy laws. It is important to note that security and privacy can be maintained even on a common host.

This common host system for storing local school data, accessible to both LEA and Department of Education staff, would be beneficial to all users. The standardization of data entry, storage, and access would greatly increase both local and state productivity and efficiency. With a common host, the majority of Department reports, such as the Fall Statistical Report and the End of Year Report, could be generated automatically with minimal LEA staff time. Authorized individuals at local and state levels could sign on to a microcomputer workstation at any point on the system to update the files, retrieve information, or generate reports.

There are other benefits of the common host concept. System tools such as a standardized query language, program generators, and report generators would be available to all users. Having software reside on a common host also offers the opportunity to make modifications in one place, and then to generate them throughout the network. A common software base represents unlimited potential for public domain software, site-licensing for statewide purposes, and even instructional software designed to supplement the curriculum.

The proper and efficient management of the common host is a major factor in the success of SPIN. Accordingly, the Study Team recommends that the common host system be administered as a service bureau by a joint committee composed of LEA and Department users. Maintenance and operation of the system would be the responsibility of staff hired and supervised by this committee.

USERS OF A COMMON HOST

Most of the information on the system will be entered and retrieved at the local school level. Users external to the local school system will have access only to those common data files necessary to generate their information needs, subject to the authorization of LEA staff. The Department of Education has staff in a number of areas who will need to use some of the data for LEA reporting purposes, such as compiling financial aid statistics, curriculum assessment information, basic skills scores, and certification data. The common host concept also makes it possible for the Department to make information immediately available to local school districts. Such information includes grant amounts, funding information, demographic data, programmatic comparisons, certification information, and availability of certified teachers for employment purposes.

The system would also provide summary data of statewide trends and statistics to respond to many of the information needs and requests outlined in Chapter One. This data will provide a more comprehensive and accurate source of information than is currently available. A host computer system has significantly greater capacity to store and process historical data for individual LEAs and for all LEAs in the Commonwealth for an extended number of years. The major uses and applications of the computerized system will revolve around the school in which the student is enrolled. However, the data base on the common system can also be used to analyze statewide trends, make projections, and formulate statewide policies.

NETWORK DESIGN AND OPERATIONAL PROCEDURES

A statewide network must be designed to link all of the school-based computers or terminals electronically so that certain public data elements can be transferred to a common host for storage in the data base. Although the technology exists to connect various mainframes and microcomputers, the challenge will be to develop a software system that will provide immediate access to information with the least amount of disruption or modification of existing automated systems.

The Team examined several networking options and it soon became evident that a school district could choose from a variety of communications networks.

The Study Team recommends a system that would operate in the following manner:

- o A microcomputer with sufficient memory to store school data would reside in each participating local school building or "logical school" to automate the school's daily record-keeping processes.
- o Updates to the local school file would be forwarded to the school district level or directly to the common host using any of the following methods:

1. Terminal in an individual school to a local district mainframe or minicomputer.
2. Micro in a local school to local mainframe or mini.
3. Terminal or micro to Department regional education center access points to the statewide common host network.
4. Local school or LEA terminal or micro directly to the statewide network.

- Periodically, school district files that are part of the common standardized file system would be forwarded to the common host.

Depending on the size of the local school system, many options or variations would be possible. For example, in a larger system it may be more advantageous to have local school site terminals which are connected to a district level or city-wide mainframe that would, in turn, pass data files to the common host. In a very small school system the district may need only one microcomputer where everything is collected, stored, and forwarded from one local source. Small schools may also opt to use the Department's regional education centers as a point of entry into the common host system.

In the case where the communications pass through the district-wide system it is desirable for each local school to have direct access to use of the data on the common host.

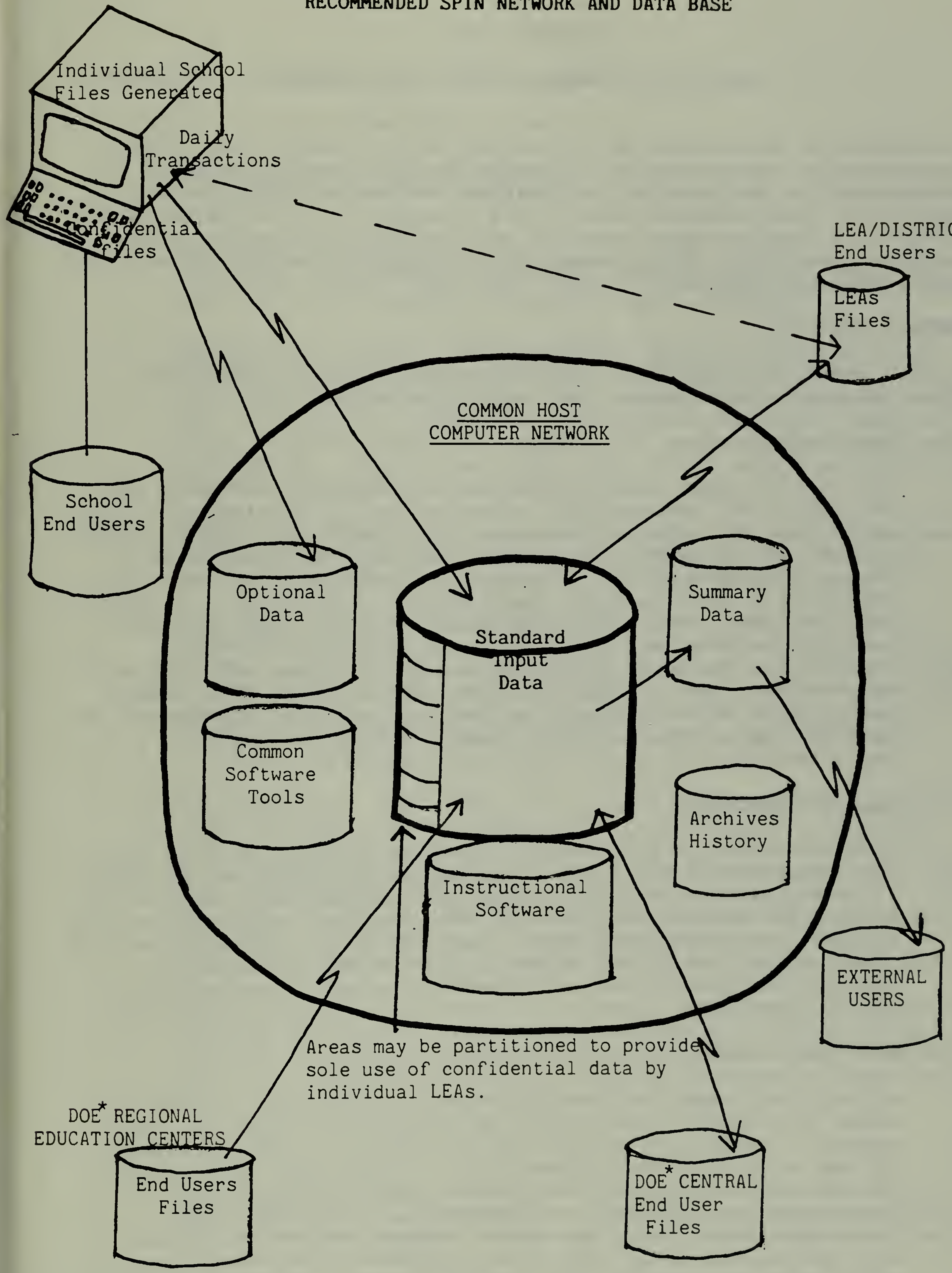
The network and the common host hardware and software would be managed using the service bureau concept. Common host services such as networking software, data base administration, or software programming would be handled by a common host service bureau staff, described earlier in this chapter.

Preliminary research indicates that cost effective statewide networks similiar to SPIN have been developed by other state education agencies including Florida, Ohio, and others. The Team is convinced that the technology is currently available to develop an electronic network for Massachusetts that will service the data gathering and reporting needs of both the Department and local education agencies.

Figure 2, p.15 demonstrates the concept of the common host having multiple points of access to the common host data base. The arrows in this diagram illustrate how each end user has two-way information transmitting capability to the common host hardware and software. A local school would have the option of going through the school district's link to the common host, going through a Department regional education center, or going directly to the common host.

FIGURE 2

RECOMMENDED SPIN NETWORK AND DATA BASE



*Department of Education

CHAPTER FOUR

BENEFITS TO MASSACHUSETTS EDUCATORS

No information system can be all things to all people, and SPIN is no exception. Implementation of SPIN, however, would represent a quantum leap in the kind of information available about public education in Massachusetts and in its accessibility. Implementation of SPIN will produce many tangible and intangible benefits to the education community. This chapter will highlight major economic and functional advantages.

ECONOMIC BENEFITS

Specific benefits would fall into three major categories: cost avoidance, cost displacement, and new opportunity.

- **Cost Avoidance.**

  The current data collection process requires more than the mere physical "collection" or gathering of information. In most cases it requires a panoply of related activites: forms production, printing, collating, mailing, holding of workshops, data generation, tabulation, re-tabulation, editing, keypunching, programming, duplicating, and filing, to name a few. Because data under SPIN would be generated and automatically edited at its source, the availability of information would be primarily a matter of how often it was transmitted from a local site over phone lines to a common host. Many of the related activities would be eliminated or substantially reduced, resulting in direct saving of Department or LEA staff time and resources.

- **Cost Displacement.**

  Time now spent on processing school data would be available for other functions. The ratio of collection time and effort to that spent in actually using and making sense of data may be as high as four to one. In schools, the ratio may even be higher. An integrated system such as SPIN, with a focus upon the utilization of and access to data, could radically improve and expand the Department's technical assistance to school districts.

- **New Opportunity.**

  An exciting aspect of the proposed system is that it would allow more direct understanding of both strengths and weaknesses in education across the Commonwealth. An integrated system which is user-focused will increase the availability of information to staff who do not have a technical orientation to data processing. Furthermore, a revamped file structure, especially one which stores data at the lowest unit of measurement, will create opportunities for analysis which were previously unavailable even to the most expert programmer.

FUNCTIONAL BENEFITS

- **Collection and Reporting of Data.**

  1. Elimination of Multiple Entry. Units of data will be entered only once instead of many times in different locations within a school.

  2. Elimination of manual record-keeping at the school level. For most schools that rely heavily upon paper records, data will be more conveniently stored and retrieved.

  3. Reduction of manual record-keeping for the Department of Education. With SPIN, the Department will not need a duplicative system of paper and computerized records. Of more than thirty collection instruments currently sent to LEAs, eighteen would be reduced and seven would be entirely eliminated. We estimate this will cover more than 80% of the numeric data now processed.

  4. Speed. By drastically streamlining the collection process, data transmitted from schools or LEAs will be final and usable on a same-day basis, rather than months later.

  5. Accuracy. There will be no need to edit data because an automatic editing function built into the software will alert school staff to inaccuracies at the point of entry. "Masked" errors which are often impossible to catch in mathematical checks--such as tabulating a pupil in the wrong grade category on an enrollment report--will be substantially decreased.

  6. Auditability. The audit function will be easier because of improved accuracy and consistent record-keeping systems.

  7. Minimization of ad hoc requests. The Department would have a more coordinated, understandable information system. Requests for data that already exist should be eliminated. Knowledge of a school's record-keeping system should discourage requests for data which clearly do not exist.

  8. Archiving. The concept of a "common host service bureau" includes storage of historical information, retrievable at the user's request. This archive will either "back up" a district's present filing and storage process or serve as the primary site, at the district's discretion.

- Use of Data.

  1. Expanded user base. LEAs, individual schools, the Department, and other interested parties with appropriate clearance will all share access to appropriate non-confidential data. Advantages include:

- A simplified process for retrieving information about other school districts. (Fewer intermediaries required.)
- Increased productivity value of the data.
- Chances increase for creative, unique analyses.
- Improved understanding of the meaning of educational data and the appropriateness of particular analytical measures.

2. Better support for legislative proposals.

3. Better response to the general public.

4. More flexibility and specificity. Paper reports usually provide only part of the information a requestor wants and nearly always provide far more than is needed. Computer access allows more specific and uncluttered utilization of the information.

5. Integrated file structure. A modular, unified view of a data base's organization improves the ease of use not just for casual users, but also for professional programmers and analysts who currently have to sift through disparate files and formats to extract particular data elements.

6. Longitudinal comparisons. To the extent possible, the proposed "summary level" file of the most commonly used information will make historical comparisons easier. Relative rates of change, or measures such as spending levels or test scores, are often more revealing over a period of time than for any one point in time.

7. Cross tabulation of separate measures. The Department currently has substantial quantitative data about programs--such as the numbers of females, special education students, bilingual students, and so forth. In many cases, however, there is currently no way to interrelate categories except through statistical estimates. A pupil-based system would allow for these subcategorizations and would significantly upgrade the power of the data.

8. Looking at previously unmeasurable phenomena. In addition to allowing for cross tabulation, which by itself opens up new avenues of analysis, it would become possible or less difficult to assess many areas. For example, pupil-teacher ratio, which now is limited to an entire district's average, could be examined in terms of distribution across grade level, type of class, type of pupil, or other factors.

o **Management of Data.**

1. Enhance ability to diagnose educational problems and suggest solutions. Too often, decision makers are thrust into a position of offering solutions before fully understanding the problem. In many cases a problem is too complex to measure effectively, such as the collection and analysis of data for the purpose of identifying issues and making recommendations regarding school "dropouts." The SPIN data base will resolve many difficulties in measurement, if only to clarify that some phenomena are simply too complex to measure.

2. Improve local management tools. LEAs and schools will have improved management capacity because:

   - Data about school operations will be integrated and easier to use.

   - Common host services will provide a broader spectrum of software and technical assistance than most districts currently have.

   - Schools could have access to external kinds of data, such as municipal finance data from the Department of Revenue and federal census data.

   - Schools will be able to make comparisons with similar districts and schools.

   - Schools will have current data to formulate budget requests.

3. Free up staff for other responsibilities or to expand data analysis.

4. Create new opportunities for technical/advisory assistance. If it knew how each district handled its management information system tasks, the Department could better advise on how to make use of the data without first having to learn what data exist, how they are stored, what software is needed, etc. Assistance and sharing between districts would also be facilitated.

5. Upgrade monitoring of compliance with the requirements of mandated programs because of more accurate, timely, and specific data.

6. Implement Chapter 188. Without SPIN, certain new required data--such as class size, curriculum, and teacher information--will be difficult to collect and to utilize effectively.

7. Reduce maintenance of individual systems. A standardized system reduces the time needed to upgrade, archive, and maintain the individual systems.

These economic and functional benefits are but a few of the specific results which can be anticipated from implementing SPIN. Long term results, such as improved relationships between the Department and local schools and districts, can be expected over a period of time.

CHAPTER FIVE

VALIDATION STRATEGY AND RESOURCE REQUIREMENTS FOR IMPLEMENTING SPIN

The system concept which the Application Study Team has recommended represents a major change in the way that data/information is generated and processed throughout the educational community. Thus, it is essential that an intensive effort be made to obtain widespread understanding of the proposal and to assess objectively the feasibility of implementing SPIN from the standpoint of cost and potential benefits. This chapter proposes a validation or pilot phase and outlines the resources required to implement it.

SYSTEM CONCEPT REVIEW

The first phase of the validation process will involve a series of meetings with constituency groups within the system, contact with other organizations utilizing large scale networks, and an investigation of experiences in other states where large scale pupil-based information system development projects have been undertaken.

o **Constituency Review.**

The Application Study Team plans to discuss the proposed system with a variety of constituency groups prior to requesting any formal approval from the Board of Education or the Department. Only in this way can the Team adequately assess how those organizations that will be affected by SPIN perceive it, with respect to daily reporting requirements or use. Representatives from several constituency groups--central and regional office Department staff, superintendents, principals, school business officials, and so forth--participated in meetings of the Application Study Team during the initial design phase. However, there are a number of issues which now require further discussion and feedback from a larger and perhaps more representative segment of these organizations.

Discussion points include the following:

- Basic concept of a school-based system.
- Authorized and appropriate use of data once it is in the system.
- General security and confidentiality issues.
- Need for the compatibility of any proposed networking with existing local hardware/software.
- Available funding sources and estimated costs.
- Pilot testing.

- Administration of the system.
- Degree to which such a system would provide tangible benefits to those who generate and use education-related information.

o **Information Gathering.**

An effort will also be made to gather as much information as possible from other organizations that have designed and installed large-scale information system networks. Making a major effort to learn from the experience of others can help avoid serious errors in planning related to:

- Technological options.
- User participation.
- Funding and potential costs.
- Data base design.
- Implementation phases and scheduling.
- Procurement.
- Administration of the system.

This information gathering should not be limited to the experiences of other Massachusetts state agencies but should extend to educational systems in other states where large-scale, school-based, student-based systems have been proposed or implemented.

o **Planning and Advisory Committees.**

From this process of constituency review and information gathering, the Team recommends the creation of planning and advisory committees representing major data users to guide and assist project activities.

PILOT TEST OF SYSTEM FEASIBILITY

In addition to widespread discussion of system characteristics and implications, a critical component of any validation strategy must involve pilot test sites as remote locations to the common host. Two pilot phases are proposed. The first pilot phase would consist of a test of the network in several districts under conditions of limited functionality, but would result in a potentially significant reduction in manual reporting. The second pilot phase would test the full functionality of the system--that is, all school procedures and a fully loaded test network configuration--in a limited number of schools and districts. For example, the second pilot phase will include sites with no current data processing capacity, and will test operation with an expanded data base, multiple hosts, and other system features.

- **Phase I: Limited Functionality.**

  A number of considerations led to the recommendation that the initial pilot be limited primarily to student activities or data elements and the exception reporting associated with them. For one thing, the student data base and data elements account for a significant amount of manual reporting which is requested by the Department. The pilot would identify the benefits that would accrue from eliminating a number of these reporting requirements. In addition, the student data base and associated procedures may be more uniform and established in most schools than some of the other procedures, and therefore may require less initial development. Finally, exception reporting for attendance, drop-outs, tuitioning in and out of a district, and special education transfers between logical schools are critical activities and should be pilot tested as early as possible.

  The only exceptions to this concentration on student records which are recommended for serious consideration are Chapter 188 requirements and limited financial reporting. Chapter 188 requirements extend beyond student records to curriculum information, data on school assessments, and other areas. Because of the importance of the legislation, SPIN's ability to accommodate at least the student portions of this information gathering should also be tested at the earliest opportunity. The reporting of financial data from schools and school systems continues to be a problem and the opportunity to introduce standard software that is compatible with the Uniform Municipal Accounting System (UMAS) and Department End of Year Report requirements should not be lost.

- **Phase I: Data Files.**

  The recommended student data files for the pilot should correspond to the major categories of information related to student activities on data elements discussed in Chapter Three. The specific data elements and the level of detail for exception reporting to be pilot tested must still be determined. However, the following types of information and levels of detail are now being considered for the Pupil Data Base.

  1. Master ID Segment.

     Name.

     Pupil ID.

     Current Address.

  2. Demographic.

     Parent/Guardian/Special Custody--Name.

Address if Different from Student's.

Phone.

Emergency Contact(s).

Relationship.

Address.

Phone.

Miscellaneous Instructions.

Race/Ethnicity.

Sex.

Date and Place of Birth/Birth Certificate Indicator.

Transitional Bilingual Education (TBE)/Limited English Proficiency.

Medical Certifications.

Miscellaneous Comments.

Economic Disadvantage Criteria.

3. Enrollment Segment.

    District Information.

        LEA Code.

        Non-Operating District ID.

        Receiving District ID.

        Multiple District IDs.

    School Information and Effective Dates, Reason.

        LEA Code.

        Non-Operating District ID.

        Receiving District ID.

        Multiple District IDs.

4. Program/Activity Segment.
    - Program Name/ID.
    - Grade/Level.
    - Special Education Information and Dates.
        - Prototype.
        - Authorization.
    - Occupational Education Information and Dates.
        - Chapter 74 Program(s).
        - Non-Chapter 74 Program(s).
        - Authorization.
    - Bilingual Information and Dates.
        - TBE.
        - English as a Second Language (ESL).
    - Economically Disadvantaged Information and Dates.
        - Program.
        - Authorization.
    - Gifted and Talented.
        - Program.
    - Transportation Information and Dates.
    - Chapter 1 Information and Dates.

5. Attendance Segment.
    - Homeroom/Course/Activity Schedule.
    - Exceptions to Schedule.
    - Reasons for Exceptions.

6. Evaluation/Grade Segment.
    - Current Year/Period/Semester.

  - Prior Evaluation.
  - Transcripts.

7. Chapter 188 Segments.
   - Assessment.
   - Basic Skills.
8. Financial/Accounting Segments.

o **Common Host: Pilot Options.**

The selection of the common host for the Phase I pilot should take into account the long range needs of the system and specific requirements of the pilot test. In this process, it is important to emphasize that the host belongs to the educational community in the broadest sense. There are several options which must be explored in making this selection. Examples include:

1. Service Bureau (private).
2. Board of Regents Computer Network (public).
3. Minicomputer in Bureau of Nutrition.
4. Mainframes in Vocational Schools.
5. Mainframes in Local Educational Agencies.

There are also a number of other issues that need to be addressed in the pilot site selection including costs, networking capacity and flexibility, software compatibility, storage, access, administrative arrangements, available services, and, of critical importance, willingness to participate in the development and testing of the proposed system.

o **Pilot Schools: Selection Criteria.**

The Application Study Team recommends that the Phase I pilot take place in three LEAs, and in all the schools in each pilot school district.

Selection criteria for the three districts might include:

1. Type of LEA.
   a. K-12 District with Vocational School.

b. Elementary District.

c. Secondary District (Regional) or Collaborative.

2. Size: Flexible, Yet Avoiding the Largest Cities.

3. Geography: Located Within the Purview of Three Different Regional Education Centers.

4. Current Information System (IS) Environment: Automated.

5. Special Populations (e.g., Special Education, Occupational Education, etc.).

6. Pilot should include all schools within the district.

A total of approximately ten schools in the types of LEAs indicated above, geographically distributed across the state, would be ideal. It is very important to test SPIN both in schools with data processing capacity and in schools with manual systems. However, given the limited funds available for the first pilot, it may be appropriate to demonstrate the system using test sites that are already automated.

Finally, it would be preferable to select the pilot communities from those that meet the criteria who come forward and request an opportunity to participate.

o Phase I Pilot: Evaluation.

An essential component of the pilot test is the design and implementation of an evaluation model which will allow an objective assessment of SPIN. The evaluation model will be developed in conjunction with representatives of all potential end-users of the system prior to initiating the pilot.

The proposed evaluation model will address specific issues related to the degree of achievement of the following objectives of the Phase I pilot:

- Demonstrate the ability to reformat the student data base in diverse systems and create a standardized set of data elements required for reporting purposes.

- Demonstrate the ability to transmit standard data elements from remote pilot locations to a common host.

- Demonstrate the usefulness of remote access by schools and districts to the common data base on the common host.

- Demonstrate the usefulness and increased capacity to the Department of Education and other users that will result from having current student data and Chapter 188 data available for analysis and reporting on a common host.

If the standard data base created during the pilot is sufficient to actually eliminate a number of manual reporting instruments, this would be an added bonus. The primary objective of the Phase I pilot, however, is to demonstrate the potential of the proposed system to accomplish this and other important outcomes.

- **Phase II Pilot: Full-Scale Functionality.**

  The Phase I pilot is perceived as a limited test of the system and the ability to successfully implement the network. The second phase is a full-scale test of school activities, procedures, and associated data collection as described in Chapter Three. The Phase II pilot would also incorporate procedures for testing future network, hardware, and common host(s) requirements to meet the needs of the whole system.

ESTIMATED COSTS

The Department's long-range ability to finance network hardware and software, application software, implementation of a common data base plan, training, staff, and related expenses is a basic issue that will have to be addressed. It is reasonable to expect that the project will run into millions of dollars over the five to six years needed to implement the system fully.

However, costs will vary tremendously by school/community according to types of software, hardware compatibility, data base files and formats, and other factors related to requirements for communication with a common host. This initial pilot experience will provide a basis for calculating more precise estimates of the statewide development and operating costs involved in this project.

In the meantime, the Team will prepare detailed cost estimates for the Phase I and II pilots, and recommend that the Department submit FY'87 and FY'88 budget requests to fund Phase II for the network development.

WORKPLAN

The summary schedule below provides milestones for the period from January 1986 - October 1986.

WORK PLAN
1/86 - 10/86

1/86 - Refine Common Host Options.

- Identify Pilot Funding Sources.

- Select and Size Pilot Communities.

- Determine Network Requirements.

- Size the Whole System.

- Finalize Data Base Input/Output Requirements.

- Submit Agency Data Processing (ADP) Plan to Office of Management Information Systems (OMIS).

- Develop Training and Ongoing Support Plan.

2/86 - Conceptual Signoff: Department of Education and

- OMIS.

- Define Common Data Base.

- Initiate RFP and Pilot Prototypes.

- Initiate FY'88 Budget Process.

2/86 - Select Pilot Communities.

3/86 - Issue RFP.

- Develop Pilot Evaluation Model.

4/5/86 - Evaluate Proposals.

6/86 - Sign Contract.

- Complete Requirements and Specifications.

6,7,8/86 - Design and Install Software.

9/86 - Initiate Pilot.

10/86 - Monitor, Train, and Evaluate Pilot.

- Initiate Prototypes for all Processes.

APPENDIX

OPERATIONS MANAGEMENT: SAMPLE SCHOOL/DISTRICT DATA AND PROCESSES TO BE INCLUDED IN SPIN

I. Student Enrollment and Demographic Information.

II. Define/Assign Courses/Activities to be Offered.

III. Schedule Students.

IV. Record Teacher Certification and Allocation Information.

V. Record Student Information Daily, or Periodic Exceptions.

I. Operations Management: Enroll Students, and Record Demographic Information.

A. Purpose: To Identify Students, and Record Demographic Information and Necessary Certifications/Approvals.

B. Process Outline.

1. Select Type of Enrollment, i.e., New, Transfer In-State, Transfer Out-of-State, (Location Codes are Generated If Not Otherwise Entered).

2. Display Entry Format.

    a. Enter Name.

    b. Perform Sound-Ex Search and Display Duplicates and Sound-Alikes.

    c. Select Duplicate or Sound-Alike or Accept Name.

3. For New or Transfer Out-of-State Enrollments.

    a. Enter Mandatory Information: Phone, Parent or Guardian, Shot Record and Other Medical, Birth Certificate, Emergency Contacts.

    b. Enter Other Information (May Become Mandatory After a Time Frame, Lap Time Lines); Transfer Release Waiver; Prior Educational Experience; Sending School Information (The Program Would Default to the School/District/Region in Which the Data is Being Entered Except When Sending School Information is Required--We need to be Able to Enroll Students in Multiple Schools); House Assignment; Homeroom Number; Permissions: Smoking, Driving, Parental Visitation; etc.

4. For Transfer-In-state or Prior Students.

    a. Request Transfer Authorization.

    b. Approve Transfer as Appropriate.

    c. Repeat 3 a-b. for Changes.

5. Enter Local Student I.D. as Necessary

6. Enter Authorization, Generate System-Unique I.D. and Update Student Data Base.

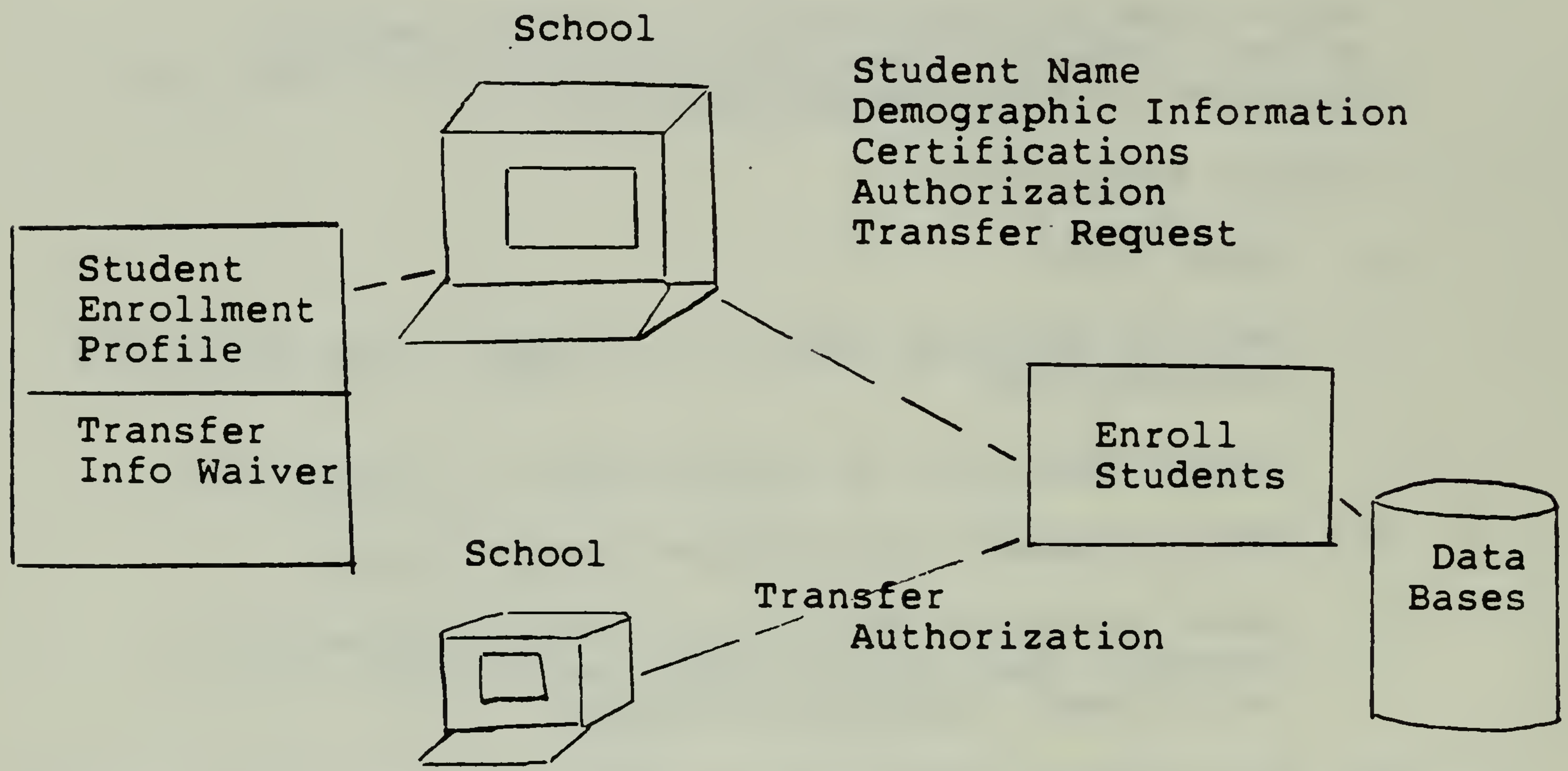
7. Display or Print Time-Dependent Reminders for Information Required in 3. b.

C. Data Bases Required.

1. Student.

2. Rules.

D. Schematic.



II. Operations Management: Define Courses/Activities to be Offered.

A. Purpose: To Describe the Name, Purpose, Minimum Results, Grade/Level, Instruction Hours, Course Materials (Text Books), etc. of a Course or Activity. To Describe Course Prerequisites.

B. Process Outline.

1. Load/Enter Course/Activity Descriptions (Department of Education Standard Description).

2. Schools Display Courses.

    a. Select Courses to be Offered and Number of Classes and Class Size.

    b. Update School Profile.

3. School Selects New or "Other" Course Category.

    a. Enter Course Description or Differences From an Established Course.

    b. A Responsible Group or Person Reviews and Monitors New Courses. (This is Not Intended as an Approval.) Enter Review Date. Content Will be Reviewed by Appropriate Group.

    c. Enter Textual Comments as Future Review Notes.

4. Add/Change/Delete Courses and Update School Profile.

C. Data Bases.

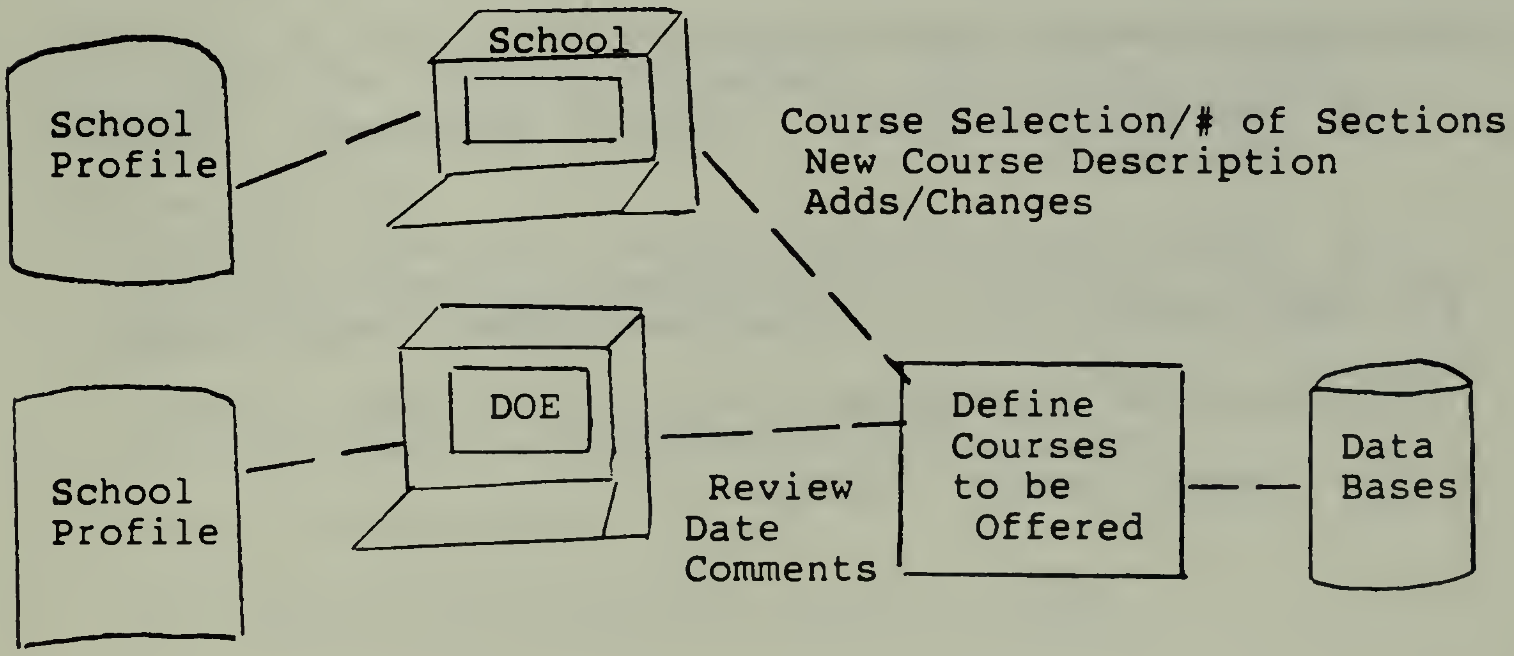
1. Course/Activity.

2. Text.

3. Rules.

4. School Organization.

D. Schematic.



III. Operations Management: Schedule Students.

A. Purpose: To Receive Course Requests. To Schedule Students to Courses and Activities Within Time Capacities and Rules.

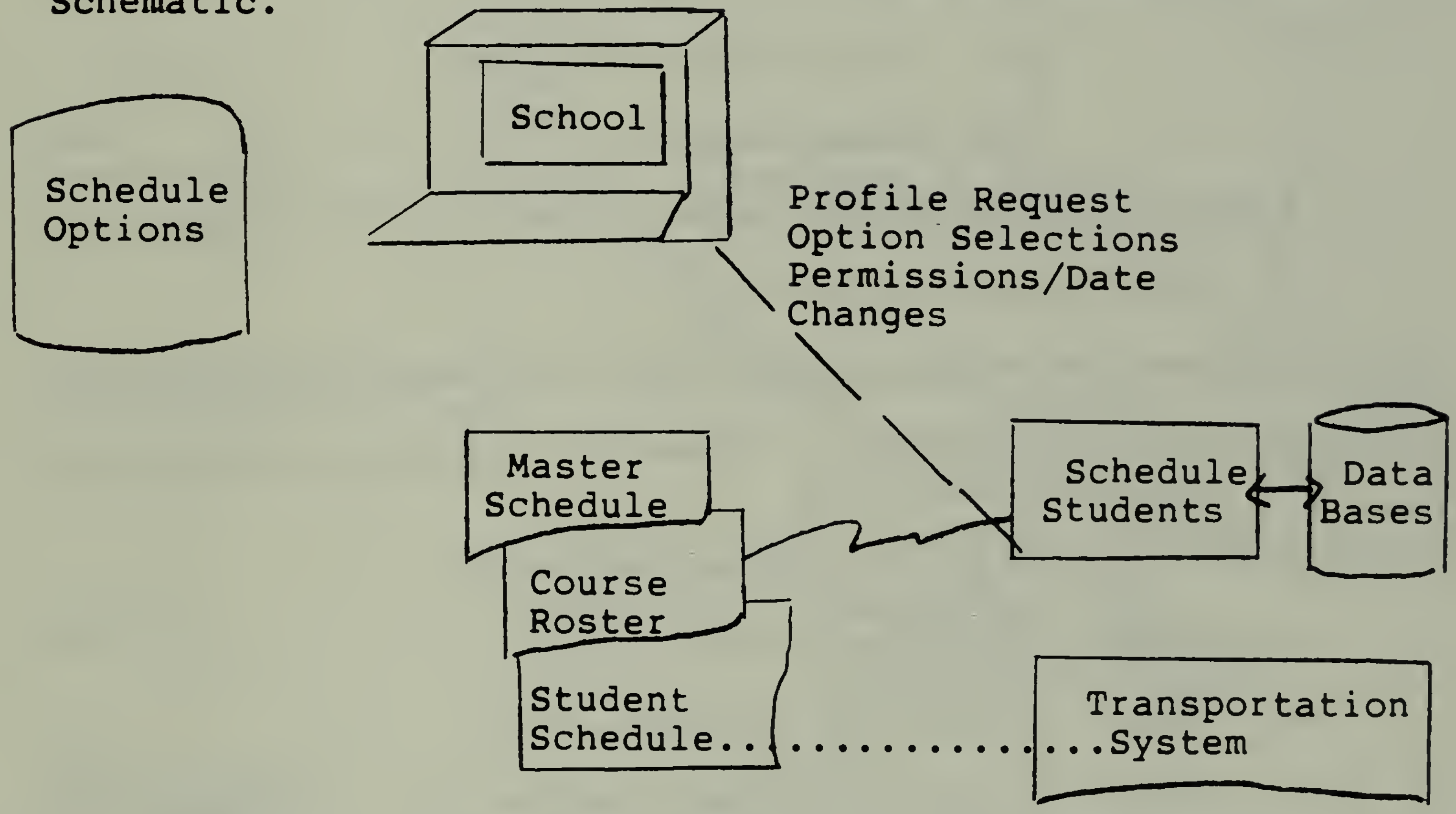
B. Process Outline.

1. Request Student Curriculum, Request Profile With Options Displayed or Printed By Guidance Counsellor or Teacher.
    - a. Student/Parent Counsellor Determines Selection Preferences.
    - b. Obtain Necessary Verbal or Written Permissions.
2. Enter Student I.D.
    - a. Display Request Profile.
    - b. Enter/Select Options.
    - c. Enter/Certify Permissions/Date.
3. Request/Print or Display Schedules (School or District Driven).
    - a. Enter Capacity or Frequency Changes.
    - b. Re-request Schedules.
    - c. Modify Schedule (Physical Room is Defined Within this Process).
    - d. Repeat 1-3 for Other Planning Purposes.
4. During the Schedule Period (School Year, etc.) Enter Necessary Changes with Effective Dates.
5. Print Schedule Upon Request.
    - a. New Master Schedules (School, Department, Teacher, Student).
    - b. Change Notification--Student, Teacher, Counselor.
6. Pass Schedule Data to the Transportation Sub-System.
    - a. Execute Sub-System.
    - b. Update Master Schedule.

C. Data Bases Required.

1. Student.
2. Course/Activity.
3. School Organization.
4. Rules.
5. Schedule.
6. Transportation (External).

D. Schematic.



IV. Operations Management: Teacher Certification and Allocation.

A. Purpose: To Profile Teacher (and Other Staff) Demographics, Certifications, Skills, Appraisals, and Career and Pay History.

B. Process Outline.

1. Receive Potential Teacher Machine Readable Information From Massachusetts Colleges.
2. Receive Applications (Certifications or Waiver Request) or Certification Supplemental Information.
3. Log in Transaction.
    a. Enter Social Security Number or Name.

b. Generate Check Receipt Number. Checks Go to Check Process.

c. Assign Transaction to Responsible Person.

4. Responsible Person Evaluates Information Against Certification/Waiver Criteria.

a. Enter/Select Certification.

b. Display Criteria. (Certification or Waiver.)

c. Enter Compliance Information.

d. Approve/Reject/Pend Transaction.

(1) Enter Reason Code(s).

(2) Enter Comments.

5. Select Inactive Teachers For Archive Notification.

a. Print Notification.

b. Receive Responses and Enter Response Information.

c. Archive Teachers. (Name Will Remain on File With Archive Location.)

6. School System Enters Waiver Request.

a. Repeat Steps 2-4 Above.

b. School Authorizes Request.

c. State Certification Approves/Rejects. (Repeat 4.)

7. Schools Enter Substitute Information. (Repeat 6a and b.)

8. Display Course(s) or Activity(s) for Teacher Allocation.

a. Display Certified or Otherwise Qualified Teacher (or Resource).

b. Select Resource for Class. (Edit for Appropriate Certification, Enter Justification if Exception.)

9. Print Master Schedule by Various Criteria, i.e., School, Room, Teacher or Resource, Student, Department.

C. Data Bases Required.

1. Certification.

2. Course/Activity.

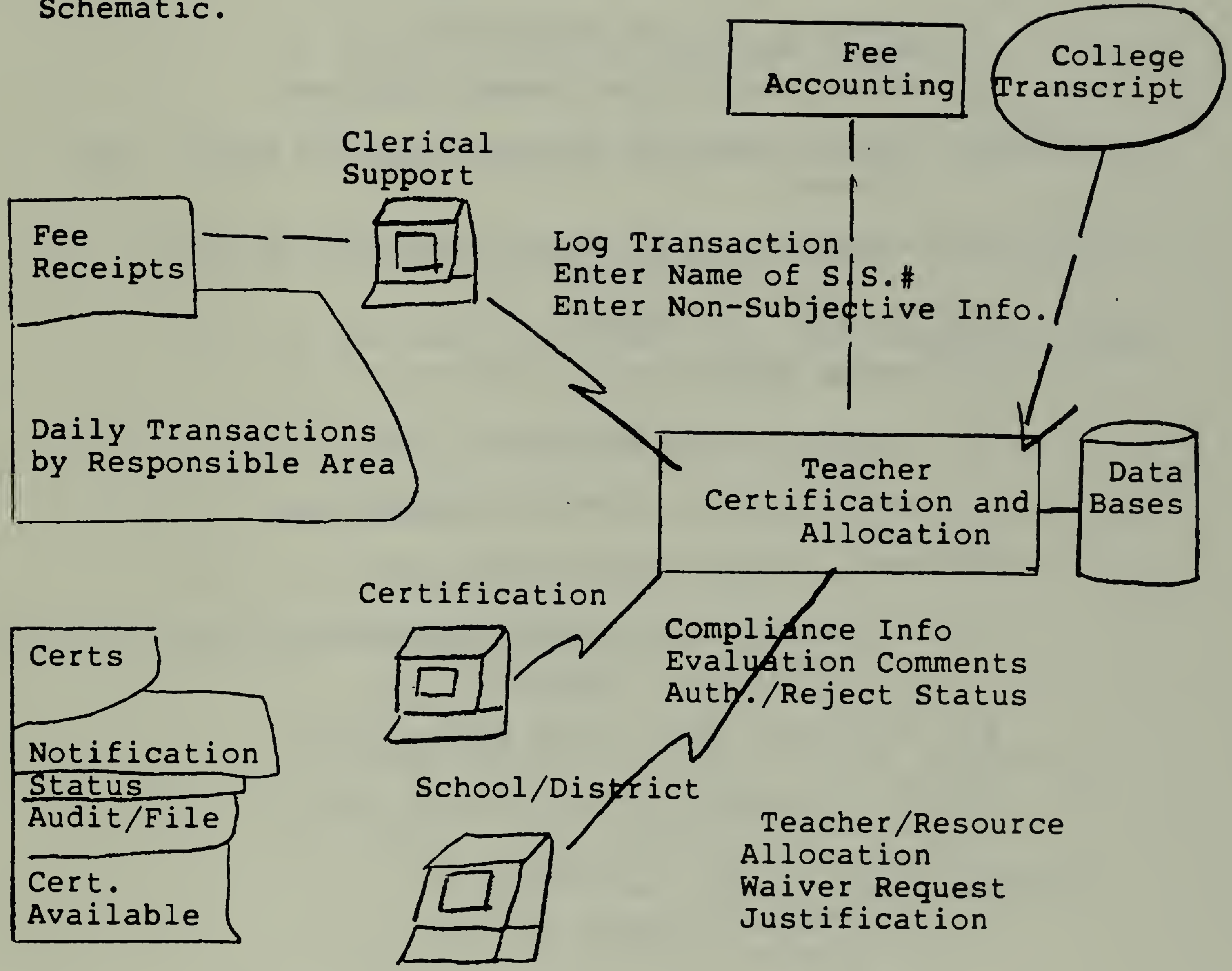
3. Schedule.

4. School Organization.

5. Rules.

6. Text.

D. Schematic.



V. Operations Management: Record Daily, Periodic, Exception Information (Student, Teacher, Resource).

A. Purpose: To Certify That Events Have Transpired As Planned or Scheduled. To Record Exceptions to Plans. To Record Value, Measurement, or Appraisal as it Relates to a Plan or Resource.

B. Process Outline: Attendance.

1. Teacher Writes Student Sequence Number on Class Roster.

a. Display Class.

   b. Enter Sequence.
   c. Print Class Register and Attendance Forms.

2. Perform Attendance Process.
   a. Print Weekly, Day by Day Class Rosters by Teacher.
   b. Teachers Take Homeroom Attendance.
      1) Check or Circle Absentees.
      2) Enter Reason Code (Name) if Known.
      3) Check Alternate Code if More are Absent than Present.
      4) Forward Copy to Office or Point of Entry.
   c. Office Enter Attendance.
      1) Enter Class I.D.
      2) Display Class Roster.
      3) Enter Absence Code for Absentees.
      4) Enter Reason Code if Known.
      5) If Sheets are Manually Sequenced, Rooms Could be Automatically Displayed.
      6) Print and Distribute Absent List.
   d. Logical Teachers Receive Absent List.
      1) Teacher Takes Attendance.
         a) Check Students Cutting.
         b) Change Reason Codes in Teacher's Course Book if Desired.
      2) Teacher Originates or Receives Exception Slips (Travel, Eject from Class, etc.).
      3) Teacher Originates Cut Slips.

   e. Students Return From Absence.
      1) Homeroom Teacher Determines Condition of Student.

        a) Student has Written Excuse; Write Reason Code/Comment on Homeroom Roster.

        b) Student Does Not Have Excuse.

            Admit Student and Write Reason Code for Unexcused Absence Pending an Excuse. Issue Admit Slip.

2) Send Student to Office or Nurse. Enter Code for Disposition.

    a) Nurse or Office Resolves Student Disposition.

    b) Write Disposition Slip, Reason, Comments, Time.

    c) Student Takes Slip to Classes and Turns it in at Last Class.

3) At the End of the Day, Cut and Exception Slips are Forwarded to Attendance Data Entry.

    a) Enter Teacher I.D.

    b) Display Roster.

    c) Enter Exceptions, Reason, Comments.

    d) Enter Student I.D.

    e) Display Student Schedule.

    f) Enter Exception Reason, Time Comments.

    g) Display File Sequence Number.

        (1) Write Number on Physical Document.

        (2) File in Entry Sequence.

4) Print Periodic Attendance Recap by Teacher. Highlight Transactions that have Changed from the Way They Were Reported.

5) Teacher is Absent.

    a) Office Receives Notification and, Optionally, a Suggested Substitute.

        (1) Enter School I.D.

        (2) Display Teachers.

        - (3) Select Teacher and Substitution Reason Code.
        - (4) Display/Print Most Qualified Substitutes with Phone Number.
            - (a) Call Substitute.
            - (b) Write/Enter Response and Substitute Teaching Expectation Code and Substitution Duration if Not 1 Day.
        - (5) Repeat (4) with Other "Most Qualified" Criteria.
    - b) Print Substitute Daily Roster at School.
    - c) Optionally, Print Daily Substitution Report by Department. (This Could be Included on the Absent Report.)
    - d) Optionally, Record Substitution Comments.
- 6) System Prints Class Rosters in Evaluation Reporting Format by Teacher at Pre-Determined Milestones. (Prior Reporting Periods Could be Included.)
    - a) Period Attendance Recap is Included.
    - b) Distribute to Teachers.
- 7) Teachers Evaluate Students.
    - a) Determine Grade if Appropriate.
    - b) Write Comments and/or Select Reasons that Support the Evaluation as Appropriate.
    - c) Return Evaluations to Data Entry.
- 8) Enter and Verify Evaluation Data.
- 9) Print Student Evaluation and Return Roster.
    - a) Return to Teacher for Verification or Comments, or
    - b) Distribute to Release Location, i.e., Homeroom or Mailroom.
    - c) Release Location Checks Off Parental Acknowledgement.

        d) Follow-up Non-Acknowledgments.

        e) Enter Non-Acknowledgements.

    10) Receive Parental Comments on Evaluation Report. Record Date and Comments.

C. Data Bases Required.

1. Student.

   Other Receivers of Service.

2. Course/Activity.

3. Certification.

   Other Skill Definitions.

4. Teacher.

   Other Staff.

5. School.

   Any Providing Location.

6. District.

7. Program or Service Grouping.

8. Schedule (Multiple).

9. Text.

10. Rules.